



A Glance at the World

The state of solid waste management in Nigeria

Nigeria is the most populous country in Africa. Located on the western part of Africa, it has a population of over 140 million people. The country has had an annual increase in population growth rate of 3.2% from 1991. The rate of urban growth has also been estimated at 5.5% per annum. Nigeria is made up of 36 states, excluding the Federal Capital Territory (FCT) Abuja, with Lagos and Kano States having populations of over 9 million persons. The FCT has shown the highest growth rate in population between 1991 and 2006, with a 9.3% increase even though it has the lowest population of slightly over 1 million compared to all the 36 states.

An insight into this population data is necessary as an increasing population poses a major obstacle to effective solid waste management. It results in increased amounts of waste generation and as a consequence, greater capital input in managing the waste; difficulty in monitoring and controlling indiscriminate littering and dumping practices; creates general enforcement problems and also hinders efficient transportation of wastes to disposal sites. Generally, problems with solid waste management in Nigeria besides increasing population are a lack of continuity in implementation of government policies, inadequately formulated policies, financial and operational constraints, and poor attitude of citizens towards waste management.

Solid waste (SW) management is a serious problem in Nigerian cities. It is estimated that an average Nigerian generates about 0.49 kg of solid waste per day with households and commercial centres contributing almost 90% of total urban waste burden. Little information exists on industrial, agricultural and biomedical waste profiles. As with most developing countries, a greater percentage of solid waste is composed of organic (putrescible) matter but recently there has been a marked increase in the amount of plastic wastes generated in Nigeria.

Waste storage and collection in Nigeria is handled either by the State Environmental Agencies or Private Companies or both. Most often, high and medium class residential areas get better services than low class ones mainly due to willingness of the former group to pay for the services which is facilitated by proper planning in these areas thereby making monitoring and enforcement less difficult. Solid waste is mainly disposed of in controlled landfills, open dumps, and water bodies. Different types of wastes including hazardous wastes are dumped together without any real awareness as to their compatibility with one another. Uncontrolled burning of dumps as well as burning of refuse from homes such as confidential documents, rags, and tyres is common. The activities of scavengers are well-pronounced at dump sites where they collect recyclables such as cans, plastics and bottles. One of the early steps towards addressing SW problems in Nigeria was the establishment of the Federal Environmental Protection Agency (FEPA) by the Federal Government of Nigeria in 1988. The main functions of FEPA as regards solid waste management is to establish, monitor, enforce standards for all aspects of solid waste management and oversee

waste treatment and disposal practices. State environmental protection agencies/boards exist throughout all the 36 states of the Federation. In trying to reinforce its commitment to the environment, the Federal Government, in 1999, established the Federal Ministry of Environment with the fundamental objectives of securing a quality environment adequate for good health and well-being, conserving and using the environment's natural resources for the benefit of present and future generations. Despite these measures, there is little on ground to account for any significant progress. A summary of the solid waste management conditions and problems for several Nigerian cities is given below:

1. FCT Abuja

Average waste generation in Abuja is 0.55–0.58 kg per person per day. This is influenced by time of year, local culture, traditions and personal income. The waste is composed of high putrescible matter (food residues) – over 50%, and a significant amount of plastic waste (over 15%). Wastes are stored in plastic bins provided by the Abuja Environmental Protection Board (AEPB). In Abuja, contractors/private firms are responsible for waste collection and disposal, sweeping of streets, litter control and cutting of grass along streets while government retains responsibility of maintenance of waste dumps and revenue collection. The stored wastes are collected by private firms house-to-house, typically between one and three times a week, depending on availability and condition of their vehicles. Recycling of waste is carried out by the informal sector. Scavengers recover recyclable materials by segregation of mixed waste at dumpsite and from street bins. Limited amounts of cans, plastics, bottles and newspapers are stored in homes and sold to itinerant buyers. No sanitary landfills exist in the FCT; solid waste from the formal collection system in the various districts of Abuja is transported to dumpsites.

2. Lagos State

Lagos is the most populous city in Nigeria and one of the most industrialized in the country even though it is the smallest in terms of land area hence enormous pressure is put on the environment due to huge amounts of solid waste generated in the state. An estimated 4 million tons of municipal solid waste was generated in Lagos in 1995. The search for a solution to the SW problems in Lagos has a long history. The responsibility of managing SW was transferred from the Local Governments to the State. This led to the establishment of Lagos State Refuse Disposal Board in 1977, later renamed Lagos State Solid Waste Disposal Board and presently, Lagos State Waste Management Authority (LAWMA), with each change in name accompanied by modified policies aimed at providing better SW management services. The emergence of LAWMA led to the incorporation of the private sector in waste manage-

ment. However in 2005, Lagos State Government in preparation for the Lagos Metropolitan Development Governance Project supported by the World Bank, restructured LAWMA to take over responsibility of waste management in the State.

Putrescible matter constitutes approx. 68% of waste generated in Lagos State. Stored wastes may be collected from house-to-house, communal depots, kerbsides, block system of collection, commercial and industrial waste collection and bulk loading. The various means of transfer to disposal sites in Lagos State include cart, open bed trucks, trucks and compactors. Recycling of materials such as paper, plastics, glass and metals considered to have high market value is usually carried out by scavengers who separate these from the waste either at source or at landfill sites and then sell them. Generally, wastes are not treated; they are transferred to the several landfill sites in the State where they are openly burnt. Lagos State has two incineration plants which have never been used, being capable of treating only wastes containing less than 20% water. Waste in Lagos contains 30–40% liquid. Recently, a composting facility has been set-up by a private company, EarthCare Nigeria Limited in collaboration with EarthCare Technologies Inc. in Odogunya, Lagos State, with the aim of processing 1500 tons of solid waste per day from which high quality compost can be produced for sale to Nigerian farmers.

In most states in Nigeria, there is a general clean-up exercise, usually once every month but the problem of waste treatment and proper disposal still persists with waste transported from specified dumpsites being openly burnt at landfill disposal sites. For the rural areas, waste is composed mostly of agricultural wastes, food wastes, leaves and paper. These are usually heaped at the base of trees or disposed of at specified dormant locations. The community women take care of management of wastes at public places like the market.

3. Progress areas

Despite the limitations facing solid waste management in Nigeria, significant progress has also been made in several areas. Composting and plastic recycling plants have been set up in Ibadan, a slaughter house waste recycling plant in Port Harcourt and an organic waste recycling plant in Kaduna, all based on local technology. In a similar manner, the Ondo State Government financed an integrated waste recycling project in which local producers used indigenous technologies to convert organic matter into organic and organo-mineral fertilizers, soft and hard plastics into pellets that serve as raw material for ancillary plastic industries, and metal scrap into ingots and finished products (Olanrewaju and Ilemobade, 2009). Also, the Lagos State Government, in a bid to improve solid waste collection and disposal, recently opened a Transfer Loading Station (TLS) which is expected to take delivery of rubbish collected by LAWMA in 10 local council areas and com-

press it in readiness for transfer to a definitive dump site. Fitted with a static hydraulic compressor, the TLS has a maximum handling capacity of 1000 metric tones (33 truck loads) of waste per day. In addition, the Federal Government of Nigeria has provided incinerators for the National Hospital Abuja, National Orthopaedic Hospitals in Dala, Kano, Enugu and Igbobi, Lagos. The Federal Government has also recently concluded feasibility studies with respect to installing integrated waste management facilities in 15 cities – Aba and Ibadan are functional at present in Nigeria. The facility will take advantage of local technology in converting waste into resource through material recovery and composting. Campaigns have been carried out in several states to educate citizens on solid waste and change public attitude towards waste management. Slogans like ‘clean and green’ have been used in states like Calabar and Imo and “Eko’o ni baje” (Lagos shall not deteriorate) in Lagos.

4. Final remarks

There is an ongoing need for proper management and upgrading of a few landfills to sanitary levels, especially in densely populated and highly industrialized areas, with proper leachate monitoring and treatment as landfills still serve as the final disposal point for all waste management processes. Moreover, solid waste management services could be improved for low class residential areas if some form of subsidy on charged fees is provided by the Government, as a large number of people in these areas have a low income. This should be coupled with environmental education, encouragement of waste reduction through reuse, proper disposal and enlightenment on the need to pay for waste management services. Government should be more financially committed to facilitate proper monitoring of offenders, activities of private waste management companies, and should carefully formulate policies to suit local conditions thereby reducing the need for frequent modifications.

References

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Generation of e-waste in public universities: The need for sound environmental management of obsolete computers in Kenya

In the public universities in Kenya the demand for computer applied courses, such as computer science, information technology, geographic information systems, information science, business information systems and geospatial engineering has increased tremendously necessitating an increase in the number of computer

hardware and software used and applied in the various programs. Kenya is thus a lucrative market to both new and used computers and the associated waste of these products. Here, exporters have turned a profit by moving large volumes of computers and other electronic waste into the country.